

APPLICATION FOR UNITED STATES LETTERS PATENT

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TITLE: ARRANGEMENT ON A SPINNING PREPARATION
MACHINE, IN PARTICULAR A CARD, WITH A
MACHINE CASING

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CROSS-REFERENCE TO RELATED APPLICATION

0001. This application claims the priority of German Application No. 102 42 929.4, filed on September 16, 2002, the subject matter of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

0002. The invention relates to a arrangement on a spinning preparation machine, in particular a card, provided with a machine casing arranged along the sides of the machine that consists of casing elements attached to support elements, wherein the casing elements can free and close off openings in the machine casing.

0003. In practical operations, cards are enclosed with a casing made of sheet metal or other materials. This enclosure serves to protect the machine, to encapsulate it against spinning dust, to enhance the optical appearance and to safeguard against accidents.

0004. U.S. Patent No. 4,813,104 describes a housing frame of a known arrangement on a card with machine casing provided with wall elements that form a closed casing and include wall elements on the sides, as well as on the front and rear and a cover element. The housing frame includes

four horizontal ground supports, four horizontal top supports and four vertical supports, which can consist of steel pipe. The known machine casing consists of supports and crossbeams, doors and flaps. The doors and flaps must be opened and dismantled for performing servicing and adjustment operations at the working members, wherein the dismantling involves unscrewing operations that frequently are very involved. The supports and crossbeams cannot be dismantled for static reasons, but considerably restrict the clearance space for performing the servicing operations. The possibility of access only separately and through the side areas and the output region of the machine is a particular disadvantage.

SUMMARY OF THE INVENTION

0005. It is an object of the invention to provide an arrangement of the aforementioned type, which avoids these disadvantages, has a simple design and considerably improves, in particular enlarges, the clearance space necessary for performing work on the machine.

0006. The above and other objects are accomplished according to the invention by the provision of an arrangement for a spinning preparation machine having

machine sides, the arrangement comprising: machine supports for supporting the machine; and a machine casing arranged along the sides of the machine and including casing elements attached to the supports, the casing elements being arranged to open up or close off openings in the machine casing so that free access is given to at least one side region and one end region of the machine.

0007. The measures according to the invention permit unhindered access to the machine. A cantilevered construction according to an exemplary embodiment eliminates crossbeams, supports and the like from the work area, thus resulting in a design where the machine is completely open and permits access from three sides. The machine sits, so-to-speak, unobstructed underneath a roof, thus making it possible to perform maintenance and servicing operations without problems. At the same time, the arrangement according to the invention makes it possible to open and/or close the casing in a structurally simple manner. The casing elements can be removed completely from the area of operation within a short time. Supports, crossbeams or the like do not exist in the area where work is to be performed.

BRIEF DESCRIPTION OF THE DRAWINGS

0008. The invention is explained in further detail in the following, with the aid of exemplary embodiments shown in the accompanying drawings.

0009. Figure 1 is a schematic view from the side of a card with the arrangement according to an exemplary embodiment of the invention.

00010. Figure 2 is a perspective view of the supporting structure with supporting elements, holding elements and traction elements according to Figure 1.

00011. Figure 3 shows an exemplary embodiment with spring-loaded covering flap and holding arms for fastening the chute feed.

00012. Figure 4 shows a one-piece holding arm that is inherently stiff and diverts tension and bending forces according to another exemplary embodiment of the invention.

00013. Figure 5 shows an angle element, which diverts bending forces from the holding element according to another exemplary embodiment of the invention.

00014. Figure 6 shows a rail on the holding element according to another exemplary embodiment of the invention.

00015. Figure 7 is a schematic view of a stop bolt for the pivoting positioning of a door, so that the door can be

released again in accordance with another exemplary embodiment of the invention.

00016. Figures 8a,8ba show a view from the side of the machine casing while it is closed (Figure 8a) and while it is opened (Figure 8b), respectively.

00017. Figures 9a,9b show doors in a side region of a spinning preparation machine that can be pivoted up and down according to another exemplary embodiment of the invention.

00018. Figures 10a,10b illustrate rotating doors and sliding doors in the side region of a spinning preparation machine according to a further exemplary embodiment of the invention.

00019. Figures 11a,11b show a view from above of the displaceable doors in the side region according to Figures 8a, 8b.

00020. Figures 12a,12b show a combination of rotating and sliding doors in the side region according to another exemplary embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

00021. Referring to Figure 1, there is shown a card 15, i.e. a high performance card DK 903 manufactured by

Trützschler GmbH, Mönchengladbach, Germany, the common assignee of the present application, comprising a feed roller 1, lickers 3a, 3b, 3c, a main carding cylinder 4, doffers 5, a stripper roller 6, crushing rollers 7, 8, a sliver guide element 9, a web trumpet 10, withdrawing rollers 11, 12 and traveling flats 13 with flat bars 14. Curved arrows indicate the rotational direction of the rollers, wherein the machine has an operating direction denoted by A. A chute feed 16, for example a TRÜTZSCHLER Direktfeed DFK, is installed upstream of the card 15.

00022. A machine casing for the card 15 consists of doors and flaps as casing elements, which are installed on supports and can open up or close off openings in the machine casing, as shown in Figures 8b and 8a, respectively, described in greater detail below.

00023. With reference to Figure 2, the supports include two vertical supporting elements 17a, 17b, for example rectangular tubes, which rest with one end on the spinning plant floor and are advantageously attached thereto with the aid of base plates 18a, 18b. The supporting elements 17a, 17b, respectively arranged on the left and right side of the card, are designed as supports and are attached from the back to the card frame 15 (see Figure 3), for example

with screws. The supporting elements 17a, 17b are inherently rigid. An essentially horizontal holding element 19a and/or 19b is attached, for example, suspended from, each supporting element 17a, 17b that is respectively arranged on the left and right side of the card 15. The holding elements 19a, 19b are also inherently rigid and advantageously consist of square pipe. A traction mechanism, for example a rope 20a and/or 20b, prevents the holding elements 19a and 19b from tilting. The ropes 20a, 20b are attached with one end to the supporting element 17a and/or 17b and with the other end in the end region of the holding elements 19a and/or 19b and extend above the holding elements 19a and 19b. The holding elements 19a, 19b are advantageously connected in their end regions with an inherently rigid cross-connector 21. The supporting elements 17a, 17b are also connected to each other with an inherently rigid cross connector 22.

00024. With the support structure for the machine casing as shown in Figure 2, it is easy to see that unhindered access to the card 15, not shown in Figure 2, is possible from two sides and from the front. No supports, crossbeams, etc. are disposed in the area where assembly and servicing operations are performed on the card 15.

00025. Figure 3 shows a plate 23, provided at the card 15 exit, and attached with hinges 24a, 24b to the ends of the holding elements 19a, 19b and can be pivoted in and pivoted out in the direction of arrows B, C. A fluid spring 25 is provided for positioning the cover flap 23, which is attached with one end to the holding element 19a and with the other end to the cover flap, such that it can pivot. On the rear side (entrance) facing away from the card 15, two horizontal holding arms 26a, 26b, for example made of square pipe, are attached to the supporting elements 17a and 17b, to which, and/or on which, a chute feed 16 is mounted. Traction ropes 27a, 27b are assigned to the holding arms 26a, 26b, respectively. The chute feed 16 is additionally attached to the support elements 17a and 17b, for example with screws. An electric switch cabinet 25 is also mounted on the supporting elements 17a, 17b. Machine frame 30 is provided with base plates 29a to 29e, and switch cabinet 28 is provided with base plates 31.

00026. According to an exemplary embodiment shown in Figure 4, the holding elements 19a, 19b and the traction element form a one-piece unit of an inherently rigid design. The holding elements 19a, 19b are shaped in the

manner of a beam, for which the height decreases away from the supporting elements 17a, 17b in the direction A.

00027. Figure 5 shows an exemplary embodiment in which the holding element 19a, 19b can also be supported from below by a catch element 32a, 32b, for example a beam or angle element that is attached to the supporting elements 17a, 17b and diverts the bending forces from the holding elements 19a, 19b to the supporting elements 17a, 17b.

00028. According to a further exemplary embodiment shown in Figure 6, rails 33a, 33b are installed below the holding elements 19a, 19b, respectively, for displacing doors 35₁ to 35₃ (see Figure 8a), cover elements or the like with the aid of rollers or the like. In an embodiment in which holding arms 26a, 26b are at the same height and are horizontally aligned with the holding elements 19a, 19b (see Figures 8a, 8b), rails 33a, 33b can be extended below the holding arms 26a, 26b for displacing casing elements covering chute 16.

00029. The doors 35₁ to 35₃ (see Figure 8a) are additionally provided with a fulcrum on the bottom of the machine frame 30. According to Figure 7, these fulcrums are provided with latch bolts 34 and springs 36, which can be dismantled without tools. The doors 35₁ to 35₃ can thus be either completely cased in or removed.

00030. Figure 8a shows an exemplary embodiment in which the machine casing has three doors 35₁, 35₂, 35₃ in one side region. Three additional doors corresponding to doors 35₁, 35₂, 35₃ are provided in the opposite side region of card 15 (not shown herein). These doors can be displaced in the direction of arrows D, E. At the front (exit) exit side of card 15, the machine casing is provided with a pivoting cover flap 23 (Figures 8, 8b). A cover plate 37 is furthermore provided above the card 15, which is arranged according to Figure 2 between the holding elements 17a, 17b and extends from the cross connector 21 to the crossmember 22. The space in which the card 15 is housed is delimited and/or covered at the rear (entrance) side of the card 15 by the chute feed 16. The doors 35₁ to 35₃ and corresponding doors on the opposite side of the machine are displaced along the rails 33a, 33b in the direction of arrow E until the side region of the card 15 is completely exposed and permits unhindered access to the card 15. As a result of the cantilevered construction of the supporting elements, the openings in the machine casing that can be closed off by casing elements such as doors, cover elements, flaps and the like can be exposed so as to allow free access to at least one side region and one front

region of the card 15. The openings are closed off by displacing the doors 35₁ to 35₃ in the direction D and by pivoting the flap 23 in the direction B.

00031. Figures 9a, 9b show an exemplary embodiment in which the doors 35₁, 35₂ can be pivoted around a horizontal axis in up and down direction, on pivot bearings (unnumbered) attached to the holding elements 19a, 19b.

00032. According to another exemplary embodiment shown in Figures 10a, 10b, the doors 35₁, 35₂ can be respectively pivoted and/or turned on pivot bearings (unnumbered) around a vertical axis and can then be subsequently displaced in a horizontal direction (arrows D, E in Figure 8a) along rails 33a.

00033. Figures 11a, 11b show a view from above of the displacement of doors 35₁, 35₂, as explained in Figures 8a, 8b.

00034. According to Figures 12a, 12b, the door 35₂ can initially be displaced parallel to the door 35₁, so that the doors 35₁ and 35₂ are arranged parallel to each other and one above the other. Finally, the doors 35₁ and 35₂ are jointly pivoted by 180° around a vertical axis. The door

35₂ can be installed displaceable on the door 35₁, i.e. with the aid of a rail.

00035. The invention is explained with the example of the machine casing for a card. However, it can apply in the same way to the machine casing for other types of spinning machines, i.e. draw frames, combing machines, opening and cleaning machines and the like.

00036. The invention has been described in detail with respect to preferred embodiments, and it will now be apparent from the foregoing to those skilled in the art, that changes and modifications may be made without departing from the invention in its broader aspects, and the invention, therefore, as defined in the appended claims, is intended to cover all such changes and modifications that fall within the true spirit of the invention.